

REMARKS

The specification is objected to for allegedly failing to adequately teach about the average amount of light calculated from the sum of amounts of light of a single color LED, as disclosed on page 7, lines 27-37. In response, Applicant has amended the specification to delete the redundant phrase “sum of amounts,” and Applicant also offers the following comments to clarify this issue.

Fig. A (on Page A-1 of the attached Appendix) shows an example of an arrangement of red LEDs (R1-R3), green LEDs (G1-G3) and blue LEDs (B1-B3) in a delta shape. The amount of light of each LED is assumed to be as shown in attached Table A (Appendix Page A-2). In Group 1, white balance is maintained by each amount of light of LEDs R1, G1 and B1. In the same way, in Groups 2 and 3, white balance is respectively maintained.

Ideally, it is desirable that a sum of the amounts of light in each color at a center of gravity of the delta shape is the same as the amount of light of each LED. This is because white balance can be maintained, and unevenness of luminance and unevenness of color in the surface can be reduced. However, the amounts of light of the LEDs in each color are different from each other, as shown in Table A (e.g., the amounts of light of LED R1-R3 are 100 lm, 105 lm and 95 lm, respectively). Therefore, instead of the amount of light of each LED, an average amount of light of the LEDs in each color is used. In other words, it is desirable that the sum of the amounts of light in each color at the center of gravity of the

delta shape is the same as the average amount of light of the LEDs in each color, which is 100 lm in red light, 200 lm in green light and 50 lm in blue light.

However, the case that an interval between the adjacent groups is greater, the sum of light at the center of gravity of the delta shape is reduced. Further, there is a possibility that variation in the amounts of light of the LEDs in each color is greater than that shown in Table A.

Therefore, in the present invention of Claim 6, a range of the sum of the amounts of light at the center of gravity of the delta shape is defined. If a shift of the sum of the amounts of light at the center of gravity of the delta shape is within this range, unevenness of luminance and unevenness of color in the surface are allowable. In the invention of Claim 6, when it is assumed that the average amount of light of the LEDs in each color is 100%, the sum of the amounts of light at the center of gravity of the delta shape is between 75% and 125%. Therefore, as shown in attached Table B (Appendix Page A-2), each range of the sum of amounts of light at the center of gravity of the delta shape is 75 to 125 lm in red light, 150 to 250 lm in green light and 37.5 to 62.5 lm in blue light.

The sum of the amounts of light at the center of gravity of the delta shape is adjusted within the range between 75% and 125% by adjustment of a row interval D1, a column interval D2, and an arrangement angle θ with the Δ groups (*see* Page 27, lines 2-10 of the Specification and Fig. 17). The sum of the amounts of light at the center of gravity of the delta shape is also adjusted within the range by selection of LED elements or adjustment of electric current applied to LED elements.

Accordingly, in light of the previous discussion and the amendments to the specification, withdrawal of this objection to the specification is respectfully requested.

Claim 6 is objected to because of the use of the term “assumed.” Applicant respectfully traverses because Applicant submits that in this case, use of the term “assumed” still provides the definiteness required by 35 U.S.C. §112. More specifically, in Claim 6, the word “assumed” is part of the following phrase:

when it is *assumed* that an average sum of amounts of light calculated from a sum of amounts of light of the single color light-emitting elements is 100%, a sum of amounts of light of the respective single color light-emitting elements at a center of gravity of the delta shape and a center of gravity of a diamond shape formed by two delta shapes is between 75% and 125%.
(emphasis added)

As can be seen from a review of the text quoted above, the word “assumed” is used as part of a mathematical expression, i.e., where one sum is assumed to be 100%, a second sum is set to be between 75% and 125%. Applicant respectfully submits that Claim 6 is definite because the claim defines that the second sum is set to be within a specific range. An analogy to the type of expression of Claim 6 would be to state that “assuming that the exterior of a device is at atmospheric pressure (1 atm), a container within the device is maintained at between 75%-125% of atmospheric pressure (0.75 atm - 1.25 atm).” Thus, as can be seen from the previous analogy, one of ordinary skill in the art would be able to determine the metes and bounds of the claim. Accordingly, withdrawal of this objection to Claim 6 is respectfully requested.

Claims 1, 2 and 8 stand rejected under 35 U.S.C. §103 as being unpatentable over Applicant's Prior Art Figures 25 and 26 in view of United States Patent No. 6,867,825 to Kanatsu et al. Applicant respectfully traverses this rejection.

Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to combine the Kanatsu et al. reference with Applicant's Prior Art Figures 25 and 26 in the manner suggested by the Examiner. As correctly acknowledged by the Examiner, Applicant's Prior Art Figures 25 and 26 fail to include a reflection plate in which "non-light emitting portions of the light emitting elements are covered by the reflection plate," as defined in independent Claim 1. Applicant's Prior Art Figures 25 and 26 also fail to disclose a similar feature of independent Claim 2, which is referred to as the "second reflection plate." Accordingly, the Examiner relied upon the Kanatsu et al. reference for this feature. However, Applicant respectfully submits that one of ordinary skill in the art would not have combined Kanatsu et al. with Figures 25 and 26 in the manner suggested by the Examiner, as discussed below.

One example of such a reflection plate of Claim 1 (or second reflection plate of Claim 2), in which the non-light-emitting portions of the light-emitting elements are covered by the reflection plate, is shown in Applicant's Figures 1 and 3. As can be seen in Figures 1 and 3, reflection plate 2 covers the non-light-emitting portions of the light emitting elements 3, and the reflection plate is between the non-light-emitting portions of the light emitting elements 3 and the diffusion plate 1. The reflection plate 2 of Figure 3 also includes the "through holes" through which the light-emitting portions can be fit, as defined in

independent Claim 2. Figure 2 shows another embodiment of the reflection plate 2 (of Claim 1), which lacks the through-holes of Claim 2, but still covers the non-light emitting portions.

As can be seen in Applicant's Prior Art Figure 26, the reflection plate 2 of this device does not cover the non-light emitting portions of light emitting elements 7. Thus, the Examiner relied upon the Kanatsu et al. reference for this feature. However, Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to modify the device of Applicant's Prior Art Figures 25 and 26 in view of the Kanatsu et al. reference because the device of Figures 25 and 26 and the device of Kanatsu et al. both use different types of light sources, with different configurations and different shapes. More specifically, in Figures 25 and 26, the light sources are color LEDs (light emitting diodes) or VFDs (vacuum fluorescent displays), which are generally button-shaped and extend upwardly and in a generally perpendicular direction from substrate 4. In contrast, in the device of Kanatsu et al., light sources 10 are white cathode ray discharge tubes, which are tubular-shaped, and extend between two side walls such that that tubes extend generally parallel to a substrate. Thus, due to these differences in types of light sources (color vs. white, LED/VFD vs. cathode ray tube) and the shapes of those light sources (button vs. tube), the configuration of the reflector 12b of Figure 4 of the Kanatsu et al. reference is very different from the configuration of reflector 2 of Applicant's Prior Art Figures 25 and 26. Accordingly, due to these differences in the configuration of the reflectors as well as the differences in the types and shapes of light sources, Applicant respectfully submits that one of ordinary skill in the art would not have modified the reflector 2 of Applicant's Prior Art

Figures 25 and 26 in view of reflector 12b of the Kanatsu et al. reference. Thus, for at least this reason, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claims 1 and 2 and associated dependent Claim 8 under the combination of Applicant's Prior Art Figures 25 and 26 and the Kanatsu et al. reference.

Further, with regard to independent Claim 2, Applicant also traverses the rejection because, even assuming *arguendo* that one of ordinary skill in the art were motivated to combine the Kanatsu et al. reference with Prior Art Figures 25 and 26, the resulting combination would still lack the claimed "through holes." One embodiment of the invention defined by Claim 2 is shown in Applicant's Figure 3, which includes "through-holes" in reflector 2 that surround the LEDs 3 such that the light-emitting portions of LEDs 3 fit inside of the through-holes, but the non-light emitting portions are covered by the reflector 2. In contrast, as can be seen in Figure 4 of the Kanatsu et al. reference, recesses 12f of reflector 12 b are not "through-holes" but are instead merely notches or recesses on the edge of reflector 12b. Accordingly, for this reason also, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claim 2.

Claims 3-5 and 7 stand rejected under 35 U.S.C. §103 as being unpatentable over Applicant's Prior Art Figures 25 and 26 in view of United States Patent No. 5,384,658 to Ohtake et al. Applicant respectfully traverses this rejection.

Applicant respectfully requests the withdrawal of this §103 rejection because one of ordinary skill in the art would not have been motivated to combine Applicant's Prior Art Figures 25 and 26 with the Ohtake et al. reference because the Ohtake et al. reference

relates to the use straight fluorescent tubes and Prior Art Figures 25 and 26 relate to the use of LEDs (light emitting diodes) or VFDs (vacuum fluorescent displays). Secondly, even assuming *arguendo* that one would have been motivated to combine the references, the proposed combination still lacks: (1) the light sources “arranged on only one of a slope or side of the linear projected portions” (emphasis added) of Claim 3; and (2) the light irradiation angle correcting means located “in light-emitting portions or on the light emitting portions of the light-emitting elements” (emphasis added) of Claims 4 and 7.

Initially, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to combine Applicant’s Prior Art Figures 25 and 26 with the Ohtake et al. reference because the Ohtake et al. reference relates to the use straight fluorescent tubes and Prior Art Figures 25 and 26 relate to the use of LEDs and VFDs. For reasons similar to those advanced above with regard to the §103 rejection under the combination of Prior Art Figures 25 and 26 and the Kanatsu et al. reference, the device of Prior Art Figures 25 and 26 and the device of the Ohtake et al. reference would not have been combined, in the manner suggested by the Examiner, due to the differences between in the types of light sources, which have different configurations and different shapes. More specifically, as mentioned above, in Figures 25 and 26, the light sources are color LEDs or VFDs, which are generally button-shaped and extend upwardly and in a generally perpendicular direction from substrate 4. In contrast, in the device of Ohtake et al., light sources 2 are white straight fluorescent tubes, which are tubular-shaped, and extend between two side walls such that that tubes extend generally parallel to a substrate. Thus, due to these

differences in types of light sources (color vs. white, LED/VFD vs. fluorescent tube) and the shapes of those light sources (button vs. tube), the configuration of the light source portion of the device of Ohtake et al. reference is very different from that of the device of Applicant's Prior Art Figures 25 and 26. Accordingly, due to these differences, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the device of Applicant's Prior Art Figures 25 and 26 in view of the Ohtake et al. reference in the manner suggested by the Examiner. Thus, for at least this reason, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claims 3-5 and 7 under the combination of Applicant's Prior Art Figures 25 and 26 and the Ohtake et al. reference.

Additionally, with regard to independent Claim 3, even assuming *arguendo* that one would have been motivated to combine the references, the proposed combination still lacks the light sources "arranged on only one of a slope or side of the linear projected portions" (emphasis added). One example of an embodiment of the invention defined in independent Claim 3 is shown in Applicant's Figure 7, which includes linear projected portions 19, "wherein each of the linear light sources [3] is arranged on only one of a slope or side of the linear projected portions [19]," as defined in Claim 3. In contrast, as can be seen in Figure 4 of the Ohtake et al. reference, light sources 2 are not arranged on one of the slopes or sides of the linear projected portion, but are instead arranged next to the linear projected portion, on the horizontal base surface. Accordingly, for this reason also, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claim 3 and associated dependent Claim 5.

With regard to independent Claims 4 and 7, even assuming *arguendo* that one would have been motivated to combine the references, the proposed combination still lacks the claimed light irradiation angle correcting means located “in light-emitting portions or on the light emitting portions of the light-emitting elements” (emphasis added) of independent Claims 4 and 7. Applicant’s Figure 4 shows one example of the claimed “light irradiation angle correcting means,” which in this case is prism 6 (mirrors or diffusers may also be used). As can be seen from a review of Figure 4, prism 6 is located on the light-emitting portion of light-emitting element 3. (It could also have been located “in” the light emitting portion, and still have satisfied independent Claims 4 and 7.)

In contrast, in Figure 4 of the Ohtake et al. reference, the Examiner equated the triangular projection between the light sources 2 with the claimed “light irradiation correcting means.” However, as can be seen in Figure 4, the triangular projection is not arranged “in light-emitting portions or on the light emitting portions of the light-emitting elements” (emphasis added), as defined in independent Claims 4 and 7. Instead, the triangular projection is arranged next to, but does not contact, the light sources 2. Thus, for this reason also, Applicant respectfully requests the withdrawal of this §103 rejection of Claims 4 and 7.

As a final matter, Applicant appreciates the Examiner’s indication that Claim 6 contains allowable subject matter and will be allowed if the claim objection (discussed above) can be overcome. Since the claim objection is believed to have been overcome, for the reasons set forth above, Applicant respectfully requests an indication of the allowance of this claim. Additionally, Applicant would also like to point out that the claimed delta shape

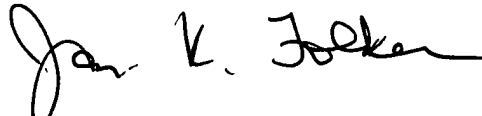
is not necessarily an equilateral triangle (as indicated by the Examiner on page 8, lines 3-5 of the January 19, 2006 Office Action), but is instead any triangular-shaped pattern.

For all of the above reasons, Applicant requests reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By



James K. Folker

Registration No. 37,538

May 19, 2006

Suite 2500
300 South Wacker Drive
Chicago, Illinois 60606
(312) 360-0080

Customer No. 24978
P:\DOCS\1324\70182\A99139.DOC